AP/CPW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES

APPLICANT	:	Stephen Miller
SERIAL NO.	:	10/726003
FILED	:	November 12, 2003
TITLE	:	Collapsible Structure Frame
ART UNIT	:	3636
EXAMINER	:	Winnie S. Yip
DOCKET NO.	:	9539a
CUSTOMER NO.	:	021905

July 5, 2006

Commissioner of Patents
P. O. Box 1450
Alexandria, VA 22313-1450

APPLICANT'S BRIEF

Real Party In Interest

The real party in interest is the inventor, Stephen Miller.

Related Appeals and Interferences

None.

Status of Claims

There are twelve (12) claims pending, and all are under final rejection and all are on appeal.

Status of Amendments

There were no amendments after Final rejection. The Claims on appeal are set forth in the attached Appendix, with emphasis on the claim language that Applicant believes distinguishes his invention from the prior art, for example, as in Claim 61, "... ***said tensioning member being operably connected between the second ends of the first and second elongated rigid mem***bers ***to form second flexible joints thereat, each said second flexible joint being operably connected to an adjacent frame section.***

Summary Of The Invention

The invention, as illustrated in which FIGS. 1, 4A and 5 of the attached drawing, comprises a collapsible support structure frame 10 that may be a truncated icosahedron geodesic structure. The structure 10 may include a plurality of generally vertical sections 12 a, b, c, d and e. Each of the sections 12 a, b, c, d and e may include

a first elongated rigid member 14a, a second elongated rigid member 14 b and a third elongated rigid member 14c where the third elongated rigid member 14c may also comprise the first elongated rigid member in an adjoining section 12b, which may also contain a second elongated rigid member 14b' and a third elongated rigid member 14c'. Each of the sections 12a, b, c, d and e may have an upper collapsible member 30 a, b, c, d and e and a lower collapsible member 32 a, b, c, d and e, more fully described below. Each of the sections 12 a, b, c, d and e may have a roof section 20a, b, c, d and e, which may be comprised of a first roof rigid member 22 a and a second roof rigid member 22b, where the second roof rigid member 22b may be the first roof rigid member in the adjoining roof section 20b which can also include a second roof rigid member 22c. It can bee seen that each of the sections 12a, b, c, d and e form the essentially vertical side walls of the structure with the collapsible members 30 a, b, c, d and e and the collapsible members 32a, b, c, d and e forming the sides of a pentagon polygon. The collapsible sections 32a, b, c, d and e can form the base of the collapsible support structure 10 and the collapsible members 30a, b, c, d and e may form the top of the essentially vertical side walls of the support structure 10 formed by the adjoining sections 12a, b, c, d and e.

As shown in Fig. 4(a) the apex 82b of the section 12a of the vertical walls of the structure 10 is shown in more detail to explain the interrelationship between the rigid members 14 a, b and c, and the collapsible members 30a and by example 30b forming the section 12a. Each of the elongated rigid members 14a, b, and c may consist of an elongated wooden dowel 16. Each of the elongated

rigid dowels 16 may have attached to either end thereof an eyelet, e.g., a screw-in eyelet 18. An upper flexible circumferential tensional support member, e.g., a length of rope (not shown) may extend through the eyelets 18 on the upper ends of the dowels 16 (not shown) -forming the elongated rigid structural members 14a and 14b, which may be positioned adjacent to each other forming an upright triangular portion 50a (Fig. 2) of the section 12a along with the lower collapsible member 32a. A lower flexible tensional circumferential support member, e.g., a length of rope 42 or cable, may extend through the lower collapsible support member 32a (shown in phantom by dotted/dashed lines) and through the pair of eyelets 18 on the lower ends of the dowels 16 forming the elongated rigid members 14b and 14c. Similarly the upper length of rope (not shown) extends through the upper collapsible member 30a between the joined ends of the elongated rigid structural members 14a and 14b and the upper end of the elongated rigid structural member 14c, and the lower length of rope 42 extends between the eyelets 18 on the lower ends of the elongated rigid structural members 14b and 14c that are joined together thereby, such that the elongated rigid structural members 14b and 14c along with the upper collapsible member 30a form an inverted triangular portion 52a (Fig. 2) of the section 12a. Thus it can be seen that the section 12a can be in the form of a parallelogram, with the corners of the parallelogram formed by upper junctions 80a and b and the lower junctions 82a and b, with the upper collapsible member between 80a and b forming the base of the inverted triangular portion 52a and the lower collapsible member 32a forming the base of the upright triangular portion 50a of the section 12a.

In the embodiment shown in Fig. 4A it can be seen that the collapsible member 30a and 32a may be formed by a pair of hollow cylindrical tubes 62 and 64 and an outer tubular sleeve 70. In the embodiment shown in fig. 4 the pair of tubes 62, 64 extend substantially the length of the base of the respective upright and inverted triangular portions 50a and 52a and the outer sleeve 70 slideably engages both the tube 60 and the tube 62 when the respective upper or lower collapsible member, e.g., lower collapsible member 32a is in the rigidized configuration. The abutment of the tubes 60 and 62 at junction 72 is illustrated in Fig. 4(a). This abutment serves to hold the rigidized collapsible member 32a in compression when the tensile forces exerted, e.g., by tightening the rope 42 around the lesser circle traveled by the rope 42 (along with the similar action of the upper rope (not shown) gives the structure 10 its structural rigidity.

Turning now to Fig. 4(b) it can be seen that the outer sleeve 70 is of a length that it can be slideably moved to enclose only the one or the other of the two tubes 60, 62, such that the rigidity provided by the sleeve 70 engaging both the tubes 60 and 62 is eliminated. This enables the respective ends of the elongated rigid structural members, e.g., 14a, b and c, the former two of which were maintained in separation by the collapsible member 32a being rigidized, to move toward each other, enabling collapsing and folding of the structure 10, when done in conjunction with similarly removing the rigidity of each of the collapsible members 30a, b, c, d and e and 32a, b, c, d and e.

Turning now to Fig. 5 there is shown a more detailed view of an embodiment of an upper terminal junction or apex 80(a)

according to the present invention. The eyelets 18 for each of the dowels 16 forming verticle poles 14a and 14b and roof pole 22a are joined by having the rope of cable 40 forming the upper flexible circumferential support member threaded through them and passing through the adjacent hollow tubes 64 of the upper collapsible member 30e and 62 of the upper collapsible member 30a, with the vertical poles 14a and 14b forming a triangular portion of section 12a and roof pole 22a extending to the top of the structure 10. This is shown in further detail in Fig. 6. Turning to Fig. 6 there is shown a perspective view of a portion of the collapsible structure 10 according to the present invention showing an entire vertical section from the ground to the apex of the embodiment 10. Fig. 6 shows that the roof poles 22a, b, c, d and e are joined at the top apex of the structure, e.g., by an apex ring 120. The apex ring may be, e.g., s ring that has a hinged opening allowing the ring to be inserted through the eyelets 18 and the upper ends of each of the roof poles 22a, b, c., d and e. Alternatively the apex ring 120 may simply be a piece of rope or cable threaded through the eyelet 18 openings.

Issue

Did the Examiner error in rejecting Claims 61 through 72 under 35 USC 102(b) as being unpatentable over Brady 5,423,341?

Grouping Of Claims

The claims stand or fall as a single group.

SUMMARY OF ARGUMENT

The Examiner is improperly construing the disclosure of Brady in rejecting the claims on appeal because Brady fails to disclose forming the flexible joints ***from the tensioning member*** as required by Applicant's claims. In contrast Brady uses a joint 22 and states in column 5, lines 37-39, "...A preferred location of the line 27 is around the pivotal connections 22 between the roof members 11 and wall members 21..." In Brady, his joint 22 is a separate structure and his line 27 does not function as a joint, contrary to Applicant's invention.

REJECTION UNDER 35 U.S.C. §102(b)

A careful analysis of the Brady Disclosure reveals that the joint 22 contemplated by Brady is not the same or equivalent to the joint used in Applicant's invention.

Brady Disclosure

> Brady discloses a structure in some respects like Applicant's structure As shown in FIGS. 1 through 5, it comprises a unitized foldable tent frame 10 that includes a plurality of elongated roof members 11, each having an upper end 12 pivotally joined at a common location by a central hub 13. The pivotal movement of the elongated roof members 11 at the central hub 13 includes rotation from the folded position 14, as seen at FIG. 1 where the roof members 11 are substantially parallel; through intermediate position 15 as seen at FIG. 2; through intermediate position 16 as seen at FIG. 3, whereat the roof members 11 essentially form a plane by radially extending from the central hub 13; through a raised position 17 as seen at FIG. 4; to the final raised and locked position 18 as seen in FIG. 5. The

central hub 13 may be formed like the hub member 45 portion of the perimetric hub 44, the hub member 45 design allowing the full rotation by the pivotally attached roof members 11 which is required for the central hub 13.

As viewed with the tent frame 10 raised, the lower end 19 of each roof member 11 is pivotally connected to an upper end 20 of at least one elongated wall member 21, ***where the perimeter pivotal connection 22 may range in construction from a simple hinge (not shown) to the locking perimeter hub 44 subsequently described***. The range of rotation of perimeter pivotal connection 22 varies from the roof member 11 and wall member 21 being substantially parallel in the folded position 14 of FIG. 1, through the intermediate positions 15 and 16 of FIGS. 2 and 3, respectfully, to the raised positions 17 and 18 of FIGS. 4 and 5. ***It is desirable that the perimeter pivotal connection 22 be capable of being locked when in the raised position 17 to provide structural stability***.

With the roof members 11 and wall members 21 pivotally joined as described, the unitized foldable tent frame 10 may be collapsed into a compact folded position 14 as seen at FIG. 1, which allows the unitized foldable tent frame 10 to be conveniently stored and transported. Initially, the individual tent raiser would laterally extend the lower end 23 of the wall members 21 outwardly, as seen in FIG. 2, to approximately their final position 24 upon the ground, where the lower ends 23 of the wall members 21 are restrained to prevent inadvertent movement during the raising process. Next, the roof members 11 are progressively raised, as by upward pressure 25 at the central hub 13, through intermediate position 16 where the roof members 11 are essentially planar in their radial extension from the central hub 13 as shown at FIG. 3, to the fully raised position 17 of FIG. 4. In the fully raised position 17, if the relative position of the roof members 11 could be maintained, the foldable tent frame 10 would remain erect. While it may be possible to maintain the relative position of the roof members 11 by locking their pivotal movement at the central hub 13, such locking would be difficult to accomplish because of the normally elevated height of central hub 13 in the fully raised position 17. A second alternative is to lock the pivotal movement at the perimeter pivotal connections 22 about the perimeter of the foldable tent frame 10. However, it would be extremely difficult, if not impossible, for one individual to physically hold central hub 13 in the raised position while at the same time locking the perimeter pivotal connections 22. ***A third alternative, and a part of the present invention, additionally involves a perimetric interconnection 26 of the roof members 11 which, at least temporarily, retains the tent frame 10 in a raised position 17 by retaining the relative spacing between the lower ends 19 of adjacent roof members 11, while the individual user proceeds to lock the perimeter pivotal connections 22***.

Such means of perimetric interconnection 26 may include a line 27, such as a cord, rope, wire, chain, or string, which continuously extends about the perimeter of the raised tent frame 10 so as to form a loop whose perimeter length may be varied as required. A preferred location of the line 27 ***is around the pivotal connections 22*** between the roof members 11 and wall members 21. Upon elevating the central hub 13 to the raised position 17, the line 27 could then be tightened at its raised position 17 perimeter length thereby supporting the foldable tent frame 10 in that position 17. This is best seen at FIG. 19 where the foldable tent frame 10 is shown in the raised position 17, as held by line 27 without the use of the subsequently discussed elongated tubular eave members 32. It should be noted that, once beyond the intermediate position 16, the individual may be able to continue the raising motion by simply reducing the perimeter length of the line 27, thereby pulling the perimeter connections 22 closer together which causes the central hub 13 to continue to rise. Upon reaching the raised position 17, the line 27 may be tied off as seen at 28, to retain its length thereat, so that the individual tent raiser then is free to proceed to further stabilize the temporarily raised foldable tent frame 10.

The line 27, in forming a perimetric interconnection 26, may be elastic, so that it is capable of expanding and contracting uniformly along its perimeter length. Thus, instead of the individual tent raiser needing to tie off as at 28 (FIG. 19) the line 27 at the desired perimeter length, an elastic line 30 would be capable, without further adjustment, of expanding as the central hub 13 was raised through the intermediate position 16 (FIG. 3) where the roof members 11 are coplanar, and the perimeter length of the line 27, 30 is at a maximum, and then contracting to the perimeter length where the central hub 13 remains elevated in the raised position 17. ***The elastic line 30 between the roof members 12, may either be continuous or formed in segments connected between each pair of adjacent roof members 1***2.

Once retained in a raised position 17 by a perimetric interconnection 26, ***additional stabilization would be performed by the tent raiser***. ***This would normally include the locking of the pivotal connections 22 between the roof members 11 and the wall members 21***. A preferred perimeter hub 44 with a locking capability is discussed subsequently.

Another important means of providing tent stability, where a means of perimetric interconnection 26, as described above, is utilized, is by the use of a plurality of elongated tubular eave members 32 which concentrically enclose the perimetric interconnections 26, between adjacent roof members 12. ***The tubular eave members 32, are pivotally connected to, and extend horizontally between, the pivotal connections 22 joining the roof members 11 and wall members 2***1. For purposes of folding and expansion, the elongated tubular eave members 32 are separable into multiple, preferably two, eave member sections 33 and 34, which are

reconnected into a single continuous tubular eave member 32 when the folding tent frame 10 is in the raised position 17. The need for complete separation of the tubular eave members 32 into eave member sections 33 and 34, can be seen in the comparing the folded position 14 of FIG. 1 where the eave member sections 33, 34, as retained by the perimetric interconnection 26 threaded therethrough, would be substantially parallel, to the intermediate position 16, as seen in FIG. 3, where their inner ends 35 and 37 would be physically separated since the required lengthening or expansion of the perimetric interconnection 26 at position 16 produces a perimeter length which is greater than the total length of the tubular eave members 32. In the raised position 17, where the perimeter length of the perimetric interconnection 26 is once again reduced, the inner ends 35, 37 of the eave member sections 33, 34 return to substantially abut, allowing reconnection into a continuous tubular eave member 32. Such connection 38 between tubular eave member sections 33 and 34 may be accomplished in a variety of ways, a simple and effective manner being a connection where the end 35 of one eave member section 33 frictionally fits tightly within a ferrule 36 molded with or attached to end 37 of the adjacent eave member section 34, as better seen in FIG. 6. When eave members 32 are utilized, the next step, once the tent frame 10 is retained in a raised position 17 by the perimetric interconnection 26, would be to connect the eave member sections 33 and 34 to form the complete tubular eave members 32, to be followed by the locking of the pivotal connections 22.

While the foldable tent frame 10, will have at least one wall member 21, extending downward from, and connected to, its pivotal connection 22 to each roof member 11, the preferred embodiment, as best seen in FIGS. 4 and 5, which provides a sturdier configuration, utilizes two elongated wall members 39 and 40 which are pivotally attached, at their upper ends 20, to the lower end 19 of each roof member 11 and extend divergently downward therefrom. The wall members 39 may be pivotally joined, in pairs, to the corresponding wall members 40 pivotally connected to adjacent roof members 12, at their lower ends 23. The preferred means of pivotal joinder 42 of the lower ends 23 of adjacent wall members 39, 40 provides flexible pivotal interconnection by means of a segment of flexible material, such as a cylindrical rubber section 41, attached between the lower ends 23, such joinder 42 providing the desired variability in position of the connected wall members 39, 40, particularly when leaving or approaching the folded position 14. It may be desirable not to join, but rather to leave spaced apart one pair of lower ends 23, so as to more readily provide an entrance opening to within the folding tent frame 10 and attached tent (not shown).

In these forms of the preferred embodiment, each perimetric pivotal connection 22 generally will involve the pivotal attachment of five elongated members 43, that is, one roof member 11, two tubular eave members 32, and two wall members 39, 40. ***Although other forms of***

perimetric pivotal connection 22 may be used, the preferred form is a perimeter hub 44 which includes a hub member 45, in disk-like shape having a plurality of projections 46, ten in the preferred unitized foldable tent frame 10 embodiments, which form radial U-shaped openings 47 equiangularly disposed about its perimeter and extending inwardly towards its center 48. Within the radial U-shaped openings 47, the ends 49 of the elongated members 43 are pivotally attached, as by pivots 50, so as to be rotatable within the U-shaped opening 47. A hub lock member 51, of comparable size and shape to the hub member 45, also has a plurality, five in the preferred embodiments, of radial U-shaped openings 52 corresponding in size and angular location to the radial U-shaped openings 47 of the hub member 45. Between adjacent radial U-shaped openings 52 of hub lock member 51, projections 53 extend radially outward.

The hub member 45 and hub lock member 51 are adjacently and rotatingly connected at their respective centers 48 and 54, as by pivot 55, so as to permit rotation about common axis 56 within parallel planes. Thus, when the hub lock member 51 is rotated so as to align its radial U-shaped openings 52 with the radial U-shaped openings 47 of the hub member 45, as seen in FIGS. 12-14, the perimeter hub 44 is in an unlocked position 60, with the elongated members 43 having unimpeded rotational capability upon the hub member 45, as seen at 69 in FIG. 14. However, when the hub lock member 51 is rotated about axis 56 so that its projections 53 coincide with the radial U-shaped openings 47 of the hub member 45, as seen in FIGS. 15-17, the elongated members 43 cannot pivot through the projections 53 and thus are denied rotation. The hub-lock member 51 may have radial grooves 57 formed upon the projections 53 to detentingly engage the elongated members 43 in a locked position 58, and may also have bevelled surfaces 59 adjacent to its U-shaped openings 52 so as to make easier the initial rotation of the hub lock member 51 from the unlocked position 60 to the locked position 58.

The perimetric interconnection 26 may be attached to the perimeter connections 22 by various manners. FIG. 20 illustrates a means of attachment of the perimetric interconnection 26 in the form of a continuous line 27, 30 wherein, being enclosed within the elongated tubular eave member 32, the line 27, 30 exits through an aperture 65 formed near an outer end 66 thereof, ***crosses the hub member 45, and re-enters another elongated tubular eave member 32 at a corresponding aperture 67 formed at its outer end 68***.

The emboldened, italized, and underlined portions of the Brady disclosure discussing the nature of his joints 22 joining triangle sections of the Brady frame make it clear that Brady's joints 22 are

separate from his "tensioning member" line 27. In other words, the line 27 does not form the joints 22. Consequently, due to this structural difference, the Brady structure fails to function in the same manner as Applicant's structure. In accordance with Applicant's invention, the "tensioning member" forms part of the joint, which joint does not lock in position separate from the tightening of the "tensioning member." This is because the joint of Applicant's invention is the portion of the "tensioning member" passing between the adjoining collapsible members as shown in FIG. 5 of the Applicant's specification. Brady does not disclose this joint structure as illustrated in FIG. 5 in Applicant's drawing and set forth in the claims on appeal. Consequently, the Examiner's rejection of the claims on appeal under 35 USC 102(b) as being unpatentable over Brady 5,423,341 should be reversed.

TIME TO FILE BRIEF

The deadline to reply to file this brief falls on a July 4, 2006, and the next business day is July 5, 2006, the Wednesday following Independence Day, an official holiday for the United States Patent & Trademark Office. Applicant therefore mailed this reply on the last day to reply within the response period.

Respectfully submitted,

John J. Connors, Reg. No. 24,157
CONNORS & ASSOCIATES
1600 Dove Street, Suite 220
Newport Beach, CA 92660

PHONE 949-833-3622
FAX 949-833-0885

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being mailed with the United States Postal Service as First Class Mail, the correct postage paid, in an envelope addressed to: Honorable Commissioner of Patents, P. O. Box 1450, Alexandria, VA 22313-145020231, on July 5, 2006

By:

AUTHORIZATION TO CHARGE/CREDIT DEPOSIT ACCOUNT

The commissioner is hereby authorized to charge payment of any additional fees associated with this communication or credit any overpayment to Deposit Account No. 03-2830.

By

APPENDIX

Claims on Appeal

61. (**new**) A collapsible support structure comprising

a plurality of interconnected frame sections each comprising

first and second elongated rigid members each having first and second ends, said first ends of the first and second elongated rigid members being operably connected together to form a first flexible joint, and

a collapsible elongated member operably connected between the second ends of the first and second elongated rigid members, said collapsible elongated member having a rigid state and a collapsed state and comprising

a pair of rigid tubular members having a portion of an elongated flexible tensioning member extending through said pair,

a rigidizing member mounted to move along said pair, said rigidizing member being moveable into a position to engage each rigid tubular member when said rigid tubular members are essentially axially aligned to form the rigid state of the collapsible elongated member,

said tensioning member being operably connected between the second ends of the first and second elongated rigid members ***to form second flexible joints thereat, each said second flexible joint being operably connected to an adjacent frame section.***

62. (**new**) A collapsible support structure comprising

a plurality of interconnected frame sections each comprising

a pair of elongated rigid members each having first and second ends, said first ends being operably connected by a flexible joint, and

a collapsible elongated member having a collapsed state and a rigid state, said collapsible elongated member including a pair of tubular members and an elongated flexible tensioning member extending through said tubular members and ***operably connected between the second ends of the first and second elongated rigid members and to adjacent frame sections to form at each second end a flexible joint.***

63. (**new**) A collapsible support structure comprising a plurality of strut elements arranged in a geodesic configuration to provide a plurality of interconnected essentially triangular frame sections, one of the strut elements of each triangular frame section being collapsible and including an elongated flexible tensioning member that connects adjacent frame sections, ***each frame section having corners with a flexible joint at each corner, at least some of the corners including a portion of said tensioning member.***

64. (**new**) The collapsible support structure of Claim 63 where at least some of the triangular frame sections form a side wall that has a base and a top, said base and top including the collapsible strut elements.

65. (**new**) The collapsible support structure of Claim 64 where the collapsible strut elements in the base form into a pentagon polygon when in a rigid state, and the collapsible strut elements in the top form into a pentagon polygon when in a rigid state.

66. (**new**) The collapsible support structure of Claim 63 where geodesic configuration is substantially in the form of a truncated icosahedron.

67. (**new**) A collapsible geodesic support structure comprising a plurality of essentially triangular frame sections each having corners interconnected by flexible joints, ***at least some of the joints including an elongated flexible tensioning member,*** each triangular frame section including a pair of elongated rigid members and a tubular member having a collapsed state and a rigid state, with the tensioning member passing through the tubular member.

68. (**new**) The collapsible support structure of Claim 67 where the tubular member includes

a pair of rigid tubular members having a portion of the elongated flexible tensioning member extending through said pair, and

a rigidizing member mounted to move along said pair, said rigidizing member being moveable into a position to engage each rigid tubular member when said rigid tubular members are essentially axially aligned to form the rigid state of the tubular member.

69. (**new**) A collapsible support structure comprising

a plurality of essentially triangular frame sections ***each having corners interconnected by flexible joints, at least some of the joints including an elongated flexible tensioning member,***

each triangular frame section including a pair of elongated rigid members and a tubular member having a collapsed state and a rigid state, ***said tensioning member passing through the tubular member***, and

a predetermined number of said frame sections forming a side wall having a base and a top, said base and top each including the tubular members of said predetermined number of said frame sections .

70. (**new**) A collapsible geodesic support structure comprising

a plurality of essentially triangular frame sections, each having corners interconnected by flexible joints, ***at least some of the joints including an elongated flexible tensioning member***,

a first predetermined number of said frame sections forming a side wall having a top, ***said top including a plurality of collapsible tubular members connected from end to end by the flexible tensioning member extending through the collapsible tubular members to form a polygon structure having a circumference that is changed to move said frame sections from a state forming the geodesic support structure into a collapsed condition.***

71. (**new**) The collapsible geodesic support structure of Claim 70 including a second predetermined number of said frame sections forming a roof having an edge in common with the top and including said tubular members, said roof being folded into the geodesic support structure as said geodesic support structure assumes the collapsed condition.

72. (**new**) The collapsible geodesic support structure of Claim 70 where the flexible tensioning member has opposed terminal ends that are drawn together to decrease the circumference of the polygon structure and separated to increase said circumference.

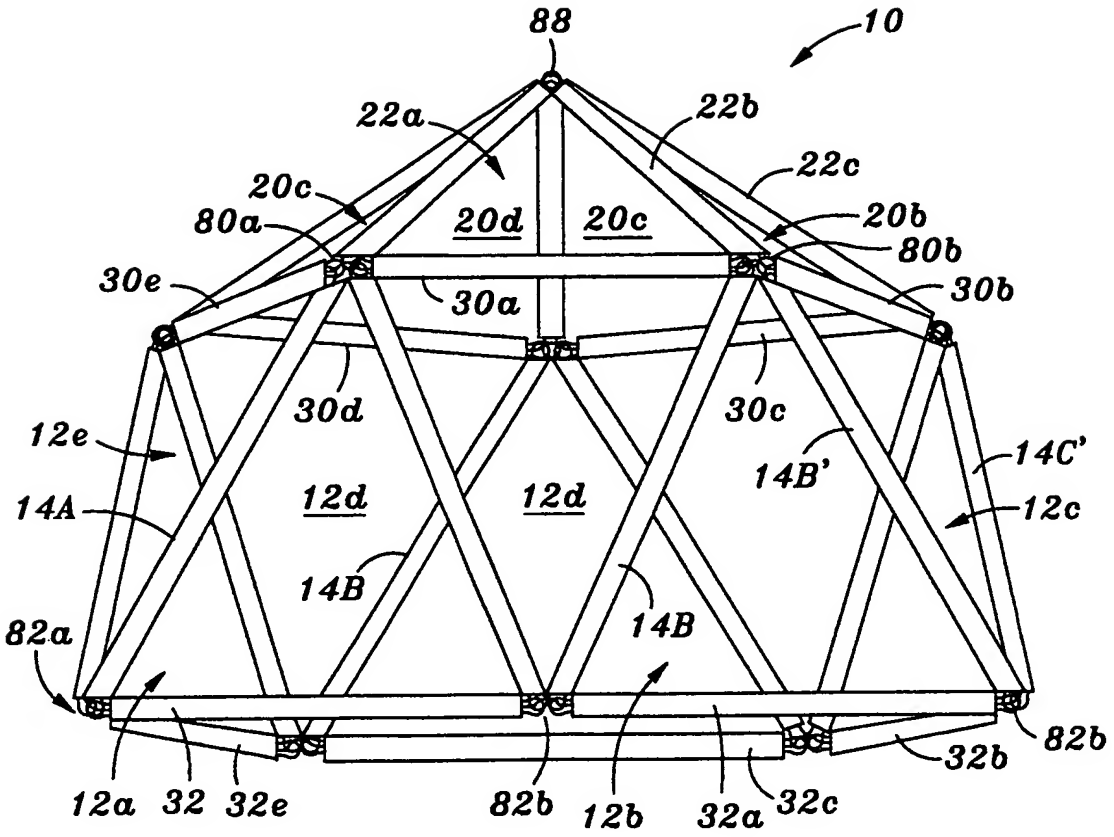

FIG. 1

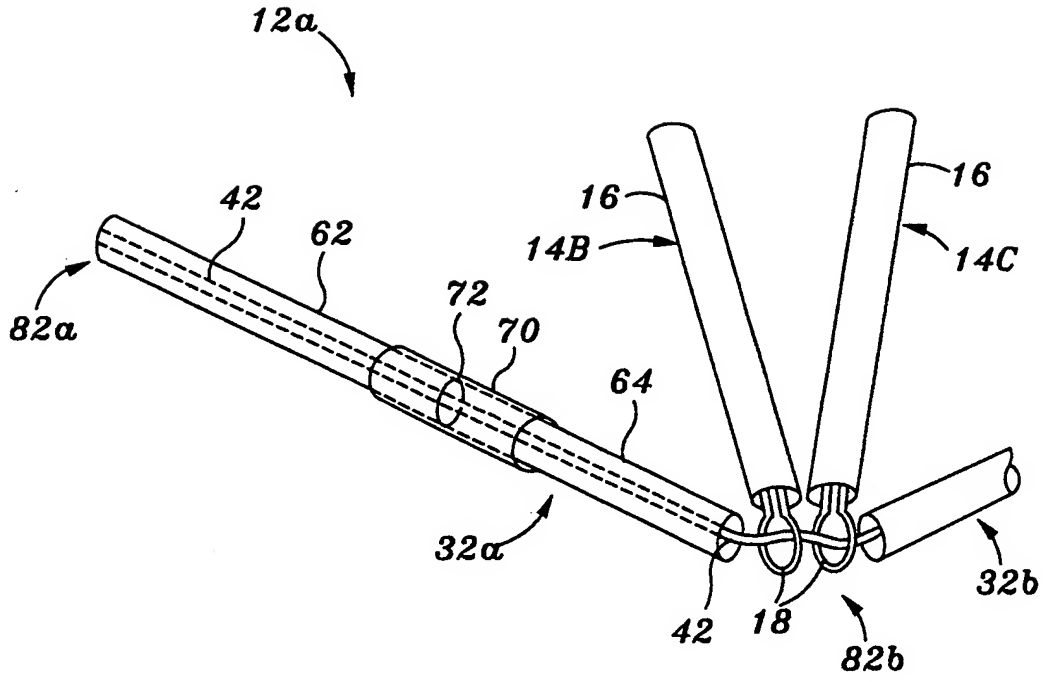

FIG. 4A

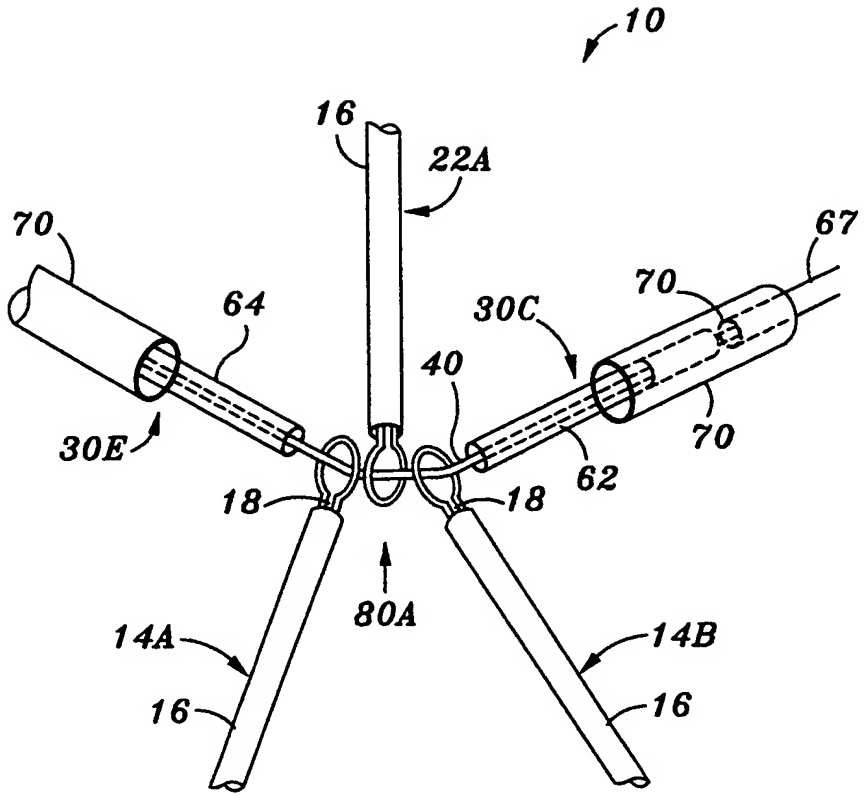

FIG. 5